http://www.australianwaterresources.com

Economic Regulation Authority
Level 6 Governor Stirling Tower
197 Saint Georges Tce
PERTH WA 6000
By email watercompetition@era.wa.gov.au

31 August 2007

Dear Sir/Madam

SUBMISSION: INQUIRY ON COMPETITION IN THE WATER & WASTEWATER SERVICES SECTOR

We request two major changes to the regulatory regime :

1) WATER PLANNING TO BE OVERSEEN BY ERA

Currently major water supply projects are subject to an environmental review process. However, given that the cost of water supply projects are bourne by the consumer, there also needs to be a process overseen by a body such as the ERA that audits the costs of future water supply options in the planning process. After major water supply projects are operational, there needs to be an audit of cost performance. At every stage of the process, cost calculations and assumptions need to be made available publicly for perusal by interested parties. The ERA should hold hearings where the cost information is queried by interested parties with the Water Corporation having to explain its figures and adjust them where there are errors or obvious deficiencies. A similar process should be set up regarding energy usage of major water supply options and health effects.

2) STATUTORY DEVELOPMENT RIGHTS FOR SHIPMENT OF WATER FROM THE ORD RIVER NEEDS TO BE GRANTED TO AUSTRALIAN WATER RESOURCES PTY LTD

Australian Water Resources Pty Ltd needs to be granted the sole right to purchase water for 0.1 cent per kilolitre for ocean going transport from

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the Ord River to places in Australia and oversees in need of this precious resource for the next 30 years.

BACKGROUND

Our Mr Michael Derry worked full time for 3 years in the mid 1980's investigating the viability of transporting water by supertanker ship from the Ord River to other areas in need of water. He carried out his research mostly from published sources and market reports with the aid of consultants and engineers.

Two of his backers were experienced in setting up public companies and developing large scale infrastructure projects. Mr Derry's work was the earliest and most comprehensive study of large scale augmentation of Perth's water supply from the North.

Had there being the right climate in Government for fostering his very innovative ideas in the 1980's and 1990's Perth would now be supplied with high quality water from the north rather than the problematic situation we are in now.

The basic problem that we have in development of innovative water supply (and many alternative energy supplies) projects is that there is no ownership of ideas. Consequently there is little incentive to develop ideas because other competitors can copy your work and get a 'free lunch' on the time and money and intellectual effort you have expended. This contrasts with oil and gas and mining where powerful ownership rights are conferred on the discoverers or developers of resource deposits. If the State wants to progress it is in its interest to grant development rights to this Company so further funding can be obtained to develop the Ord River to supply water for use by Australian capital cities and a soon to form, large scale export market. The 'Do Nothing Option' of not granting the backers of this Company exclusive rights to develop the Ord two decades ago has meant that the resource has sat idle and remained significantly underutilised.

MONOPOLY ISSUES

The situation having a monopoly like the Water Corporation control our bulk water supply is problematic in many ways :

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A) INEFFICIENCY

There is no incentive to be efficient or get things right. Despite reduced streamflows since the 1970's the Water Corporation steadfastly denied it had adequately planned for Perth's needs. Claims that there was no need to resort to desalination even under the worst secenarios of a drying climate and increased demand have proven to be erroneous.

B) INNOVATION IS STIFLED

A bureaucracy stifles innovation, as it is frowned upon by less creative and hardworking individuals. As an example, the Water Corporation when they first learned of Mr Derry's proposal to transport water by ship from the Ord dismissed it out of hand as implausible. Later when they realised that it was a feasible option, although not one of their preferred ones, they tried to dismiss the originality of his idea in Western Australia although they could not find any record of it in their previously published reports.

Here is a case of one single individual coming up with something very significant ahead of a bureaucracy with thousands of staff.

C) BIAS

We all do what we know. How many people have wanted something built and asked a metal worker what material should be used, to be told metal, then ask a carpenter, to be told wood, then ask a fibreglass expert, to be told fibreglass. People do what they know, so it is no surprise that when you ask a public water supply body headed by engineers to be told that processing water, be it by desalination or recycling is the way to get additional supplies of water. If the Water Corporation was staffed mostly by logistics managers, they would want to source water from the Ord by ship for Perth, if it was made up of environmentalists it would want to solve the problem by outlawing water consumption, if it was made up of businessmen it would want to solve the problem by charging more money for water to reduce quantity demanded and increase profit. Whoever is involved in the decision making process will approach the problem in a way that best suits their expertise and training, partly because that is how they feel comfortable, and partly out of self interest.

The Water Corporation has chosen Reverse Osmosis (RO) as the desalination process to use whereas the overwhelming number of large scale seawater desalination plants around the world use various processes that boil the water rather than forcing it through membranes under high

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pressure to remove the salt. The main advantages of these processes that boil the water are:
- they can produce electricity at the same time which gives an additional benefit to the State and at a lower cost;
- the water is much purer and contains significantly less Trihalomethanes (THMs) which have been known to cause cancer and birth miscarriages.

To reduce the THMs in the RO desalinated water and hence reduce the cancer risk, it is necessary to put the water through the RO process multiple times which uses more energy and increases the unit cost significantly. If the Water Corporation were determined to reduce the risk of THMs exposure to the public, it would result in the desalination project costing significantly more per unit of product water and producing significantly less. Consequently it has this dilemma, to produce more and be a commercial success or worry about the cancer risk to the public. Given that it controls the sampling of the THMs, and staff salaries and careers are determined by being involved in successful projects, it is under great pressure to give little priority to minimising the public's exposure to THMs.

The Water Corporation makes whatever decisions it chooses and justifies all of them on the basis of cost. Cost is the overriding factor according to the Corporation, however anyone with experience in financial analysis can tell you that numerous assumptions are needed to arrive at estimated costs, so it is very easy for someone to produce a report with the numbers supporting whichever option they want.

Given that cost is the overriding factor, there is however, no transparent process for interested persons to inquire how the Water Corporation arrived at its figures. This is akin to a Judge making a decision on something he/she has a vested interest in but will not show anyone else the evidence upon which he/she makes his/her decision.

From our web site:
http://www.australianwaterresources.com/desalination.htm
it can be seen that the cost of desalinated water produced by the Kwinana plant calculates to be $ 2.66 per kilolitre compared to the claimed cost of $ 1.45 per kilolitre. Nowhere have the Water Corporation explained in their public documents how they have addressed the fundamental problem of desalination plants worldwide that they are unreliable and are often broken down and out of service.

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One of the important factors in deciding whether desalination is an acceptable option is the claimed amount of energy use. Although the Kwinana plant has been running for some time now we have not been told power usage with matching water production figures, nor have we been told the cost that the Government has made the electricity available to the plant at.

A way of getting closer to the truth of what the true economic cost of the Kwinana desalinated water is, would be to auction the plant to commercial bidders at the stated capital cost of $ 387 million and have bidders nominate the lowest price per kilolitre of water to sell to the Government.

KIMBERLEY EXPERT PANEL REPORT
(http://dows.lincdigital.com.au/Kimberley_Water_Source.asp)

The State Governement commissioned a major report into the concept of bringing water from the Kimberley to Perth in 2005. Due to the influence of the Water Corporation in the water industry in this State and across the country the report was contaminated with Water Corporation spin and showed many failings. Despite this, the Committee did a lot of work and added greatly to the Government's overall knowledge and understanding of the concept of bringing water from the Kimberley to Perth.

Examples of the information provided which would lead any thinking person to raise questions include :

A) INTEGRATION INFRASTRUCTURE ORD END

- Water Corporation costings are based on a loading point at Still Bay (appendix 4 page 9)
- Ships of the size costed require draft in excess of 25 metres yet the draft limitation down the Cambridge Gulf to Still Bay is only 11 metres according to AUS32 hydrographic chart (R.A.N) published 1986 .
- Other suitable loading sites are available

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B) INTEGRATION INFRASTRUCTURE PERTH END FOR 50 GL A YEAR OPERATION

- $680 million for the pipeline or canal.
- $780 million for the Tankering/Water Bags.

Yet it has costed a 45 GL desalination plant (including integration infrastructure) at $376 million ?

The Yarragadee Scheme was costed at $383 million and this includes source works, 105 km pipeline and integration with the IWSS (Integrated Water Supply System) (ref ERMP, volume 1 page 1-10).

C) SHIP SIZE

- The report makes much of the fact that it is most economic to use the largest ships possible yet it ignores the fact that 3 shipyards have already been constructed around the world to build 1 million DWT ships and the Committee costed its report on 1/2 million DWT ships.
- Given that major companies very experienced in supertanker construction have spent tens if not hundreds of millions of dollars building 1 million DWT dockyards indicates that this size ship is absolutely feasible. (Note: a 1 million DWT ship can carry twice the load as a 0.5 million DWT ship, however the physical dimensions such as length breadth etc are only approximately 20 % larger).

D) SHIPPING COST

- The study was costed using new oil tankers.
- Water tankers do not need double hulls, segregated ballast tanks, inert gas systems etc etc which were mandated for oil tankers only after they had been operating many decades without them.
- Due to the fact that water tankers are not carrying an environmentally damaging cargo such as oil they can be operated for much longer before they would need to be scrapped due to structural concerns. This would significantly reduce the depreciation component in the costings.

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- The Clough (ie CEIS) costings for fuel required for ocean transportation were affected by the recent spike in world oil/fuel prices yet the desalination costings were done before this time.
- Looking at the graph Clough produced at figure 26 on page 75, the amount of fuel consumption increasing with speed looks plausible to the untrained eye. However, someone trained and experienced in bulk shipping economics would be able to pick up that the curve is not steep enough so that according to Clough's figures you would save on fuel per cubic metre of water delivered by speeding up the ship.
    - **12 knots** uses 127 tons per day or **1,499 tons for Ord-Perth return trip**
      (3,400 nautical miles)
      (3,400 divided by 288 = 11.81) (11.81 times 127 = 1,499)
    - **14 knots** uses 130 tons per day or **1,314 tons for the Ord-Perth return trip**
      (3,400 divided by 336 = 10.11) (10.11 times 130 = 1,315)
    - **16 knots** uses 137 tons per day or **1,212 tons for the Ord-Perth return trip**
      (3,400 divided by 384 =8.85) (8.85 times 137 = 1,213)

Every motorist knows that to save fuel you slow down, not speed up.

NB SEDO in Appendix 11 indicated that the data provided by Clough on energy inputs was different to other estimates they had and this could 'be due to a transcribing error'.

E) RELIABILITY

- The tanker option is very reliable, however designing infrastructure either end to a high degree of reliability is unnecessary. The Perth IWSS has large buffer storage in our dams and groundwater reserves so if a ship is delayed one day for any reason the Water Corporation just draws a bit more on our dams or groundwater.
- Designing for reliability is expensive so the degree of reliability built in must be optimised.

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F) ROBUSTNESS

- The infrastructure costed in the study has been designed to the same standards as transporting oil.
- Massive savings can be achieved on the capital cost of the infrastructure if it can be accepted that minor leaks can occur.
- Unlike oil there is no harm to the environment if water leaks.

G) DESALINATION COST

- The operating performance figures for desalination plants have been provided by the desalination industry to the Water Corporation.
- Desalination plants have major problems with reliability.
- The Water Corporation has not to our knowledge identified/publicised a functioning sea water RO plant of a similar size anywhere in the world with as constantly salty feed water as we can expect in the Sound over summer and presented its track record of performance (normally MSF or the VC processes are chosen for large scale sea water desalination plants, particularly in hot climates where the feed water gets very salty in shallow areas not subject to adequate flushing from the outside ocean).
- The plants are often estimated to achieve full output around 90 % of the time however many of them achieve much less such as 54 % calculated for Kuwait (see Water Production in Kuwait - Its Management and Economics, Marafie & Darwish, Desalination 71, Elsevier Science, 1985, page 49) The Water Corporation's figure of $1.16 per m^3 for desalination is likely to be significantly more than this in reality. For further information see our website : http://www.australianwaterresources.com/desalination.htm.
- The Goverment has claimed to be using wind power to provide electricity for the desalination plant. We are not aware of any detail about how this has been factored into their costings as alternative energy is nearly always significantly more expensive then using fossil fuels despite being a very good objective to pursue.

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H) ENERGY USAGE

- Using larger ships and operating them much slower (unlike oil, water is a low value commodity and does not need to be transported at such a high speed to get to market) results in quantum energy savings. See our website : http://www.australianwaterresources.com/energy_usage.htm

- We have done research on using the abundant tidal energy in the Kimberley to split water into hydrogen and oxygen as a future energy source with zero greenhouse emissions. It may be feasible to use this tidal power to power the supertankers as a major limiting factor with considering using tidal power in the Kimberley in the past for other purposes has always been the distance from any potential users (see The West Australian, April 6 ,1990, p24).

Below we have summarised Green House Gas emissions SEDO have calculated using the appropriate conversion factors against the information supplied to them by the consultants to the KEP (see the KEP Report at Appendix 11). These figures need further explanation which is not surprising given that SEDO makes comments that at least some of the information provided to them is different to their information and this could be due to 'transcribing errors'.

Emissions of CO2 in kgs per kl of delivered water

	Source	Midstream	Perth	Total
Pipeline	0.09	2.45	0.72	3.26
Canal	0.19	0.85	1.69	2.73
Tanker	1.46	7.70	0.97	10.13
Waterbag	1.46	5.97	0.97	8.40
Desalination	NIL	4.46	??????????	??????????

According to these figures:

- Perth Hills downhill to our Perth taps will use 69 % as much energy as piping it 300 metres uphill 1900 km from the ORD to Perth ?

- Pumping water from a tanker anchored off Perth (same pump head as desalination) into a Perth tap will require 40

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% of the energy as pumping it 300 metres uphill and 1900 km's ?

- Pumping water downhill for the tanker option at the Ord produces 0.0070 kg's of CO2 per km whereas piping it 300 metres uphill to Perth for the pipeline option uses only 0.0013 kg's of CO2 per km (ie 1/5) ?
- No account is taken of the energy cost of getting the desalinated water into Perth taps ?
- There are no scope 3 emissions for the main journey of the 1900 km pipeline option ?

The Water Corporation has not publicised the fact that at 500 ppm TDS design specification, the product water from the Kwinana sea water RO plant is not comparable to Kimberley water (approximately 100 to 200 ppm TDS) in that it is too salty to be blended with otherwise slightly too salty water such as from the Wellington Dam or other sources.

CONCLUSION

We have a number of innovations that we want to develop to further improve the economics of shipping water from the Ord River and we are earnestly waiting for the development title to be conferred on ourselves so we can proceed for the benefit of the State and country.

Regards

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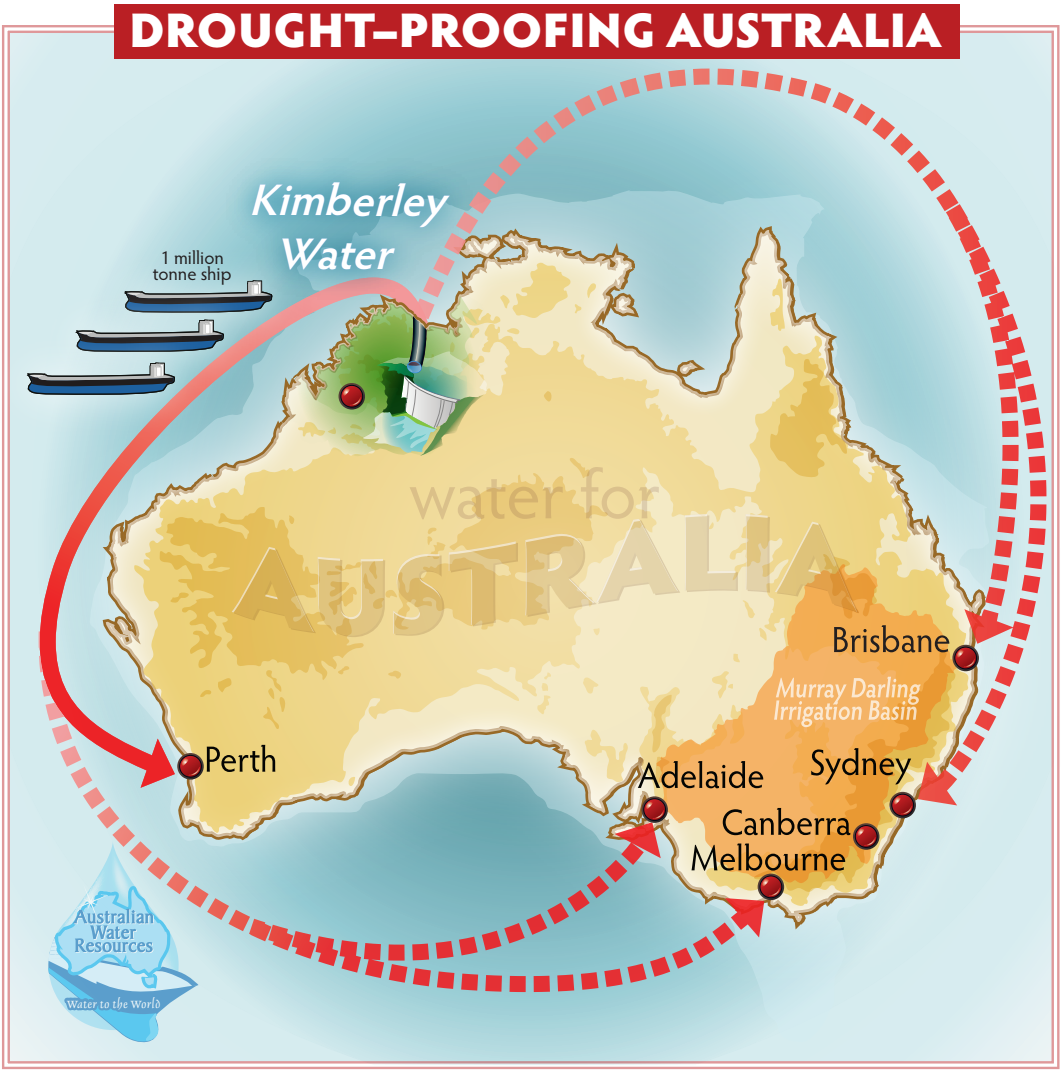
DROUGHT–PROOFING AUSTRALIA



In the l980's we costed a scheme (with the aid of international shipping consultants) at the request of the SA Government to supply Adelaide with 200 million tonnes of water annually from the Ord River at $ 2.40 per tonne. This compared with $ 7.70 a tonne for a pipeline from the Ord River and up to $ 3.50 for seawater desalination.

SHIP TRANSPORTED WATER FROM THE ORD

- Can drought proof Australian cities.
- Uses less energy than a pipeline or desalination.
- Has a low salt content and is able to be blended with other nearby slightly too salty sources of water.

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